



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/046,434

01/14/2002

James Edward MacDougall

05977PD USA

3447

23543

7590

03/25/2004

AIR PRODUCTS AND CHEMICALS, INC.
PATENT DEPARTMENT
7201 HAMILTON BOULEVARD
ALLENTOWN, PA 181951501

EXAMINER

STEIN, STEPHEN J

ART UNIT

PAPER NUMBER

1775

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/046,434

Applicant(s)

MACDOUGALL ET AL.

Examiner

Stephen J Stein

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-24, 27-33, 36 and 37 is/are rejected.
- 7) ☒ Claim(s) 25, 26, 34 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 26, 2004 has been entered.

Claim Rejections - 35 USC § 102/103

3. Claims 18-24, 27-33, 36 and 37 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 5,858,457 (Brinker et al.).

Brinker teaches a method of making a ceramic film by preparing a film-forming fluid comprising a ceramic precursor, a catalyst, a surfactant and solvents; depositing said film-forming fluid on the substrate; and removing said solvents from said film-forming fluid on the substrate to produce the ceramic film on the substrate (column 1, lines 46-48; column 5, lines 29-44; and claim 1). Brinker further teaches that the porosity of the ceramic film is 40-60% (col. 4, line 7). With regard to the claimed dielectric constant, metals content, and pore size it is expected that the disclosed ceramic film would exhibit these properties since the Brinker reference is preparing ceramic film in the identical manner as disclosed and claimed by applicants. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a prima facie case of

Art Unit: 1775

either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada*, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). The ***prima facie*** case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

4. Claims 18-24, 27-33, 36 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, obvious over anticipated by US 5,645,891 (Liu et al.).

Liu et al. teaches a process of preparing a mesoporous ceramic film comprising mixing a film fluid comprising a ceramic precursor, a promoter (catalyst), a surfactant and solvents; depositing said film-fluid on the substrate; and removing said solvents from the film-forming fluid on the substrate to produce said ceramic film on the substrate (column 3, lines 29-38; column 7, lines 22-45; and column 8, lines 14-19). With regard to the claimed dielectric constant, metals content, porosity and pore size, it is expected that the disclosed ceramic film would exhibit these properties since the Brinker reference is preparing ceramic film in the same manner as disclosed and claimed by applicants. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada*, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). The ***prima facie*** case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Allowable Subject Matter

5. Claims 25,26, 34 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

While the prior art teaches a ceramic film having the claimed properties of dielectric constant and metal and halide content (see above), the prior art of record fails to teach or suggest that the disclosed ceramic film includes pores sufficiently ordered in a plane of the substrate that an X-ray diffraction pattern of said film shows a diffraction peak at a d spacing greater than about 44 angstroms and further fails to teach or suggest that the film does not include pores sufficiently ordered in a plane of the substrate such that pattern of the film shows a diffraction peak.

Response to Arguments

7. Regarding, the rejections made under 35 USC 102, applicants in their response argue that applicants have filed a declaration under 37 CFR 1.132 in which they affirm that experiments showing that films using the surfactant of the film forming compositions of the Brinker et al. and Liu et al. references would not necessarily possess the claimed properties of the claimed films. In applicants' declaration, applicants state that they have measured by ICP-MS the sodium present in cetlytrimethylammonium chloride (CTAC), which is the surfactant used in the Brinker reference. Applicants' state that the sodium concentration was measured to be 0.115 wt.% (1150ppm) and that since this sodium concentration is of the same order of magnitude as the potassium concentration determined for BASF L121 surfactant which was used to produce

Art Unit: 1775

certain 6600 angstrom films disclosed in applicants specification, one of ordinary skill would anticipate the films of Liu and Brinker using CTAC or CTAB surfactants would result in higher concentrations of metals than that claimed by applicants.

Applicants' arguments in view of their declaration have been reviewed and carefully considered, but not deemed persuasive. First, applicants have not shown that the prior art final product of either Liu or Brinker would not have the claimed properties. Applicants' have merely made a conjecture based on the testing of one particular surfactant disclosed in the Brinker reference (CTAC). Second, it is noted that the the Brinker reference does not limit the surfactant to CTAB, but also states that "Other cationic surfactants that can be used include alkyammonium salts, gemini surfactants, cetyethylpiperidinium salts, and dialkyldimethylammonium. Anionic surfactants that can be used include sulfates, sulfonates, phosphates, and carboxylic acids. Nonionic surfactants, with the hydrophilic group not charged, include primary amines, poly(oxyethylene oxides), octaethylene glycol monodecyl ether and octaethylene glycol monohexadecyl ether" (See col. 5-6). It is not clear that all of these surfactants would have metals content that would lead to final ceramic film with higher metals content than that claimed. Thirdly, applicants are basing their presumption that final product of Liu and Brinker would have higher metals content than that claimed based on a film thickness of 6600 angstroms. The prior art (for instance Brinker) discloses that the film thickness may be 100-500 nm (1000 – 5000 angstroms), and therefore even assuming that a starting CTAC surfactant material did have a metals content of 1150 ppm which would result in a film of about 1000 ppm alkali metal in a 6600 angstrom thick ceramic film, there is no reason to believe that a film of 100nm thickness

Art Unit: 1775

would have higher than the claimed metals content. In light of these deficiencies, applicants' affidavit does not overcome the rejections over the prior art of record.

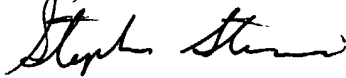
Regarding the 103 rejections over claims 25, 26, 34 and 35, applicants' arguments have been deemed persuasive and the rejections have been withdrawn. These claims have been indicated as containing allowable subject matter.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Stein whose telephone number is 572-272-1544. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 5:00 p.m. If the attempts to reach the examiner are unsuccessful, the examiner's supervisor, Deborah Jones can be reached by dialing 571-272-1535. The official fax number is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 18, 2004



Stephen J. Stein
Primary Examiner
Art Unit 1775